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General Notes.

GEOLOGY AND PALEONTOLOGY.

The Eocene of the United States.[1]—The present essay is the fourth of a series devoted to the discussion of the correlations of the formations found in the different parts of the country with one another, and with formations in other countries; and to the discussion of the principles of geologic correlation in the light of American phenomena. Mr. Clark thus describes the scope of the work.

"This essay comprises, first a general discussion of the limitation of the term Eocene as employed in American geology. The two-fold character of the Tertiary (1. Eocene, 2. Neocene) in America is insisted on.

After a somewhat extended review of the literature, in which the various opinions upon disputed points are especially considered, a general study of the Stratigraphical, paleontological, and topographical characteristics of the Eocene in the various portions of the country is undertaken.

The description of the Eocene of the United States falls naturally into the three distinct regions, viz: The Atlantic and Gulf Coast region; the Pacific Coast region, and the interior region.

Following a study of the stratigraphical relations of the Eocene of the Atlantic and Gulf Coast region, an attempt is made to correlate the very diverse formations of this great area. Four provinces are provisionally established (1. New Jersey province, 2. Maryland-Virginia province, 3. Carolina Georgia province, 4. Gulf province,) though fuller knowledge may break down their bounds. The general similarity of the deposits and their fossils to extra-American Eocene is shown, but detailed correlation is not considered feasible.

The meager knowledge of the Pacific Coast Eocene precludes any general discussion of the stratigraphical and paleontological relations of that horizon. The local peculiarities, shown both in fossils and deposits, are referred to, and the close relationship existing between the Eocene and Cretaceous is dwelt upon. Their separation is a matter of some uncertainty with our present information. Certain points of identity with Eocene deposits elsewhere are mentioned. Two groups of strata are recognized, one marine (Tejon group), the other brackish (Puget group).

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[1] Bulletin of the United States Geological Survey, No. 83, 1891. Correlation papers. Eocene. William Bullock Clark.

The remarkable conditions under which the deposits of the Interior region were accumulated and the interesting fauna and flora that they afford are fully discussed in the final division of the essay. The general relations of the fauna and flora of the Eocene of the interior to that of other regions is pointed out, though no attempt is made at a detailed correlation of its various members. The Laramie problem, although more fully presented by Dr. White in his paper upon the Cretaceous, is here referred to, and the facts are given which are said to show that the Laramie is in part Eocene. The conflict between the evidence afforded by animals and plants is stated with the consequent hindrance to satisfactory correlation.

Dr. Clark incidentally to the subject gives a historical discussion of the Laramie formation which he finally excludes from the Eocene series. This discussion is of much interest as showing the growth of opinion based on accumulating evidence. He might have been a little more explicit in his reference to the first determination of the Cretaceous age of the Laramie formation. He says, (p. 114), " Prof. E. D. Cope (Amer. Philos. Soc. Trans. xiv, 186–9, pp. 1–252) raises a doubt concerning the Tertiary age of the entire lignitic series ...... by mentioning *Ischyrosaurus antiquus* Leidy from the 'Great Lignitic' of Nebraska as perhaps of Cretaceous age, and *Hadrosaurus ? occidentalis* Leidy from the 'Cretaceous beds of Nebraska,' " etc. There was however more than the "raising of a doubt" expressed in the memoir by Cope thus quoted. He says, p. 98; "..... I instituted an examination of the forms brought by Dr. Hayden from this locality [Nebraska] and first of that most characteristic animal the Ischyrotherium of Leidy. This, as has appeared on the preceding pages I believe to be a reptile allied to Plesiosaurus, a conclusion which *at once establishes Mesozoic age of the bed.* It coincides with the presence of Hadrosaurus in indicating Cretaceous or upper Jurassic age."

We observe with surprise that Dr. Clark does not include the Plistocene in the Cenozoic series. We suppose he would relegate this age to a distinct realm, the so-called Quaternary. But the propriety of such a classification has, in our opinion yet to be shown.

Dr. Clark remarks (p. 16); "the term Eocene which is retained as equivalent to Lower Tertiary, may or may not coincide with the division so designated by European geologists." We would suggest then why adopt the term Eocene at all? One is led to suppose from this and the paragraph preceding it that the term had been originated by the U. S. Geological Survey. The article then goes on to say; "the attempt at a detailed correlation of American formations with European, so often made in the past on insufficient data, is greatly to be deprecated." This is the language of a stratigrapher, but not of a paleontologist. The correlation of horizons the world over is one of the *raisons d'etre* of the science of geology, and it is chiefly to be accomplished by the aid of paleontology. The paleontologic correlation of the American Wasatch with the French Suessonien for instance is so clear, that some day, in a comprehensive system they may be called by the same name. Various other cases are equally clear. In fact the language quoted is the expression of a chauvinism which has been characteristic of the U. S. Geological Survey, but which we hope it will outgrow. A favorable symptom is the very full consideration given to the work of its predecessors in America, as exhibitep in this able monograph by Prof. Clark.

In conclusion, an alphabetical list of the leading articles upon the Eocene of the United States is presented.

A Florida Lake Basin.—In a recent letter from Gainsville, Florida, Mr. Henry Bomford gives the following description of an interesting phenomenon:

"There is a prairie within three miles of this place that is fifteen miles in length, with an average width of five miles. Twelve years ago it filled with water to a depth of eight to twenty feet, varying according to high and low ground. This water stood undisturbed for this twelve years space of time until last August, when it suddenly disappeared in two days, leaving two small holes of water not exceeding ten acres area, and a few ponds here and there of sizes too insignificant to mention.

"The soil here is principally sand, underlaid at varying depths by very soft sand and limestone. There is some flint at great depths.

"Near the location where the water is thought to have made its exit the country is literally dotted with deep holes, varying from ten to forty feet in depth; the sides are steep and precipitous. These holes are commonly known here as sinks, and are sometimes formed in a single night.

"For days after the escape of the water from this prairie the stench of putrid fish was intolerable. The farmers hauled them off in wagons for fertilizers.

"On the prairie anywhere turtle shells can be seen, with here and there the skeleton of some unfortunate alligator that has been killed by some marksman or by some stray hunter."—*Scientific American*, April 2, 1892.

Xanthidia.—Mr. E. W. Wetherell reports the occurrence of Xanthidia in the London clays. He has succeeded in isolating these minute fossils, and finds that for the most part they follow two types, easily distinguishable, although there are many minor varieties of each of them. These organisms are often found joined together in pairs, or with five or six individuals massed together.

Their characters are as follows: Shape, lenticular; some specimens far flatter than others, perhaps owing to pressure; spines around the edge and springing obliquely from the flattened sides; or, around the edge only. The length, thickness and number of spines gives rise to the two types. The diameter is about $\frac{1}{10}$ mm. When viewed by transmitted light the body portion is of a distinct green color, marked with black spots. Glycerin shows the whole form better than any other medium.—*Geol. Mag.*, Jan., 1892.

Geological News. Paleozoic.—A microsaurian is reported from the Lancashire Coal field. The fossil comprises the head, abdominal region and base of the tail of a small animal occupying the whole of an elongated split nodule 0.08 m. in length. It has been assigned to Hylonomus by A. Smith Woodward under the name *H. wildii.* Among distinctive specific characters may be enumerated the form and proportions of the mandible and dermal armor. (Geol. Mag., May, 1891.)——Mr. Malcom Laurie has described some Eurypterid remains from the Upper Silurian deposits of the Pentland Hills, Eng., one of which has been made the type of a new genus, *Drepanopterus.* This form is characterized by the great breadth of the carapace, and by the shape of the single limb which has been preserved. The limb is long and narrow, and ends in a slightly expanded sickle-shaped segment. The genus seems to be intermediate between *Eurypterus* and *Stylomerus.* (Proceeds. Roy. Acad., Dec., 1891.)——A new Clymenia has been discovered in the Naples Beds of Western New York. It is described and figured by J. M. Clarke under the name *C. neapolitana!* The genus Clymenia has been considered a horizon-marker of the uppermost Devonian, and its discovery in a lower Upper Devonian in company with *Goniatites intumescens* and representatives of the whole series of European Upper Devonian fauna suggests the idea that the fauna of the Naples Beds may be a condensed time-equivalent of a series highly differentiated in the transatlantic Upper Devonian succession. (Am. Jour. Science, Jan., 1892.)